

display the alphanumeric message "3 MESSAGES HAVE BEEN RECEIVED", as shown at the top of the display output illustrated in FIG. 4. In an embodiment in which the displayed parameters consist only of the number of messages received, display 16 would more economically be a single 7-segment LED numeric display.

Alternatively, or in addition to these parameters, display 16 may provide other parameters, such as information identifying the sender, whether the message is email or voice mail, and the time and date the message was received. If the message was email, display 16 may also display the subject of the message, which is typically included in an email header.

As illustrated in FIG. 4, the output of display 16 preferably includes a line of alphanumeric information for each message that has been received. Processor 10 may display these lines in the temporal order the corresponding messages were received or in any other order selected by the user during system set-up, such as alphabetic order by the sender's name or by type of message. Such display techniques are well-known in email software and not described further herein. The order in which the lines are displayed may correspond to the index number, described above, that is stored with the message in memory 12.

The display output is divided into columns labeled "FROM", "TYPE", "SUBJECT", "DATE" and "TIME". The exemplary output illustrated in FIG. 3 indicates the three messages that have been received. The "FROM" column relating to the first exemplary message (the line immediately below the column labels) indicates that it was received from a caller at telephone number "619-555-1234". As noted above, processor 10 obtains this number using CND circuit 44. Processor 10 stores the number in memory 12 along with the message at the time it is received, as described above. As known in the art, a telephone number obtained using CND may be converted to an mnemonic tag, such as the caller's name, and the tag can be displayed in place of or in addition to the number.

Memory 12 may include a pre-stored correspondence or "telephone directory" between telephone numbers and the names of individuals or other identifying information. The user may store this telephone directory information during system set-up. The user may also choose to automatically store email addresses of some or all senders into the telephone directory. The set-up software can configure the answering machine to automatically strip the sender's email address from each message it receives and store that address in the telephone directory along with the sender's name.

If CND is not available or CND circuit 44 cannot read a telephone number, the indication "<UNKNOWN>" may be displayed, as shown in the line corresponding to the second exemplary message. The "TYPE" column indicates that the first message is voice. The "SUBJECT" column indicates "<NONE>" because such information relates only to email messages. The "DATE" and "TIME" columns indicate the date and time the message was received. Processor 10 includes an internal clock to maintain the current date and time, which the user can set during system set-up. The "FROM" column relating to the third exemplary message indicates that it was received from a sender at email address "ROBIN@CR.COM". As noted above, processor 10 obtains the sender's email address from the message header, which is stored in memory 12 with the other information relating to that message. In a manner similar to the above-noted conversion of a telephone number to a mnemonic tag, such as the caller's name, processor 10 can use a directory

pre-stored in memory 12 to convert the email address into a corresponding tag and display the tag in place of or in addition to the email address. The "TYPE" column indicates that the third message is email. Processor 10 obtains the text shown in the "SUBJECT" column from the message header. The "DATE" and "TIME" columns indicate that the message was received after the first message. Because the number of email messages that have been received may exceed the number of lines simultaneously displayable on display 16, keypad 18 preferably allows a user to enter commands for scrolling through displayed lines. Other display manipulations and customizations commonly used in email software may also be included. Such display techniques are well-understood in the art and not described herein.

Although the output illustrated in FIG. 4 is preferred, it should be noted that the displayed parameters corresponding to email messages may include not only information obtained from the header, but the entire header or even the entire email message. Email messages or portions thereof may be appended to the display output in the order the email messages are received. The user may use keypad 18 to scroll through the display output.

At steps 54 and 80 of FIGS. 2 and 3, respectively, either the entire email message or only a portion of it may be downloaded and stored. For example, only the header may be downloaded and stored. As illustrated in FIG. 5, the remaining portions of the message may be retrieved only if the user chooses to read the message. This alternative embodiment minimizes memory requirements and minimizes the time required for each initial telephone transaction with the on-line service. In this embodiment steps 56 and 82 of FIGS. 2 and 3, respectively, in which the downloaded message is deleted from the service provider's computer, would not be performed. In this embodiment the following method, illustrated in FIG. 5, would be included in steps 66 and 90 of FIGS. 2 and 3, respectively, in which the selected message is retrieved from memory 12 and displayed.

At step 94 processor 10 initiates a telephone call to the on-line service provider via modem 14 and DAA 20. When the on-line service provider answers, processor 10 establishes communication and logs in at step 96. At step 98 processor 10 downloads the messages and stores them in memory 12. Although portions of the messages, such as the headers or portions of the headers, are already stored in memory 12, processor 10 may nonetheless download the entire message. Alternatively, only the portions of the message that have not been previously downloaded are downloaded at this time. At step 100 processor 10 may delete the downloaded messages. At step 102 processor 10 logs out, terminates communication and hangs up the call. Processor 10 then displays the downloaded email messages, including playing audio attachments, as described above with respect to steps 66 and 90 of FIGS. 2 and 3.

It is preferred, at step 98, that processor 10 download all messages that have been received, i.e., including the non-selected messages, or at least a number of the non-selected messages, since it is likely that the user will wish to subsequently read additional messages. Nevertheless, it is suitable for processor 10 to log out, hang up, wait until the user selects another message, establish another telephone connection, log back in, and download the next selected message.

When a selected message is displayed, processor 10 preferably replaces the message summary output illustrated in FIG. 4 with the selected email message. Alternatively, if